American
GAS JOURNAL
Formerly American Gas Light Journal
EST. 1859

VOL. 120, No. 23.
WHOLE NO. 2466.

NEW YORK, SATURDAY, JUNE 7, 1924

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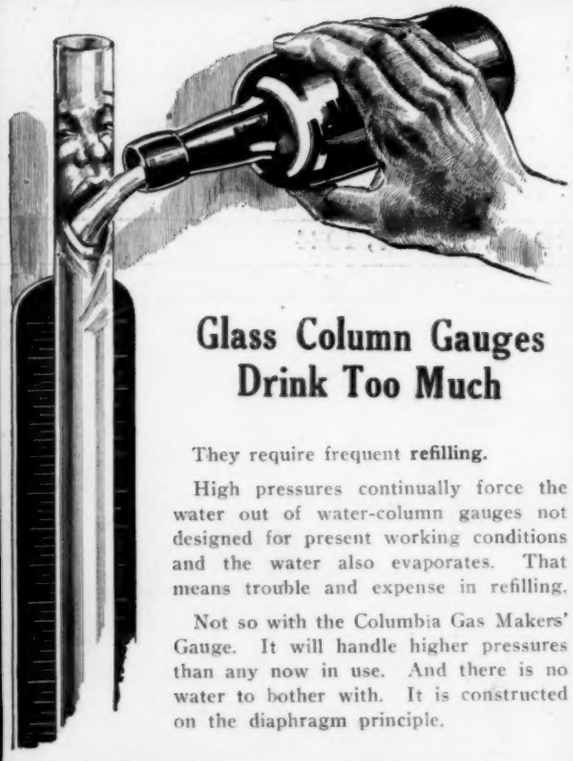

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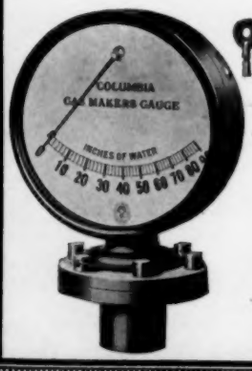

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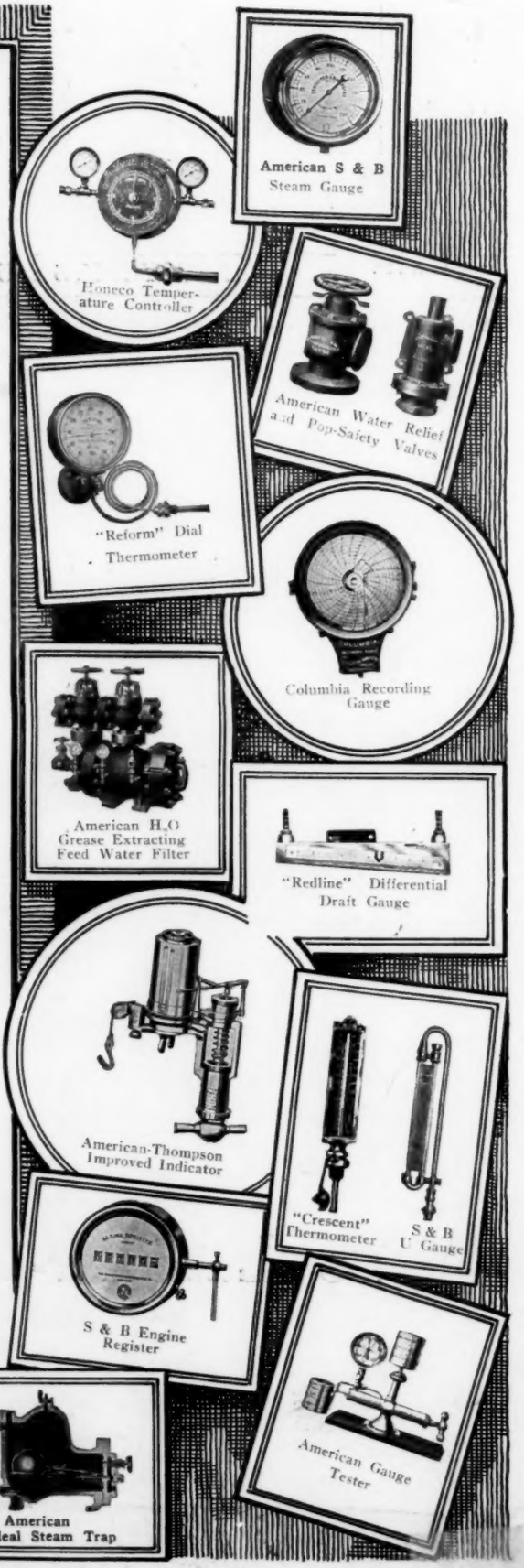
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American Gas Journal

SIXTY-FIFTH YEAR

Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

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"APPLICANT FOR MEMBERSHIP IN THE AUDIT BUREAU OF CIRCULATIONS"

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Subscription $3.00 per year, including postage, in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada, $4.00; foreign, $5.00—Single Copies, 10 cents.

AMERICAN GAS JOURNAL, June 7, 1924. Vol. 120, No. 23. Published weekly by American Gas Light Journal, Inc., New York, N. Y. Entered as second-class matter Jan. 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

AMERICAN
GAS JOURNAL

Vol. 120. No. 23 NEW YORK, JUNE 7, 1924 Whole No. 3465

House Heating Business

A few examples of house heating by gas in the territory of the Lynn Gas & Electric Co., Lynn, Mass.

George A. Wallace

Member Industrial Gas Class, Massachusetts Institute of Technology

GAS is supplied by our company to a varied territory covering suburban towns, where there is no manufacturing, seashore resorts which are practically closed during the winter months, and then Lynn itself, which, of course, is primarily a manufacturing city, with residential sections.

We have never made a drive for house heating, but have had many inquiries from our customers, and to date have made some eighteen or twenty installations of all kinds. We always explain to the inquiring party at the outset that he must expect to pay from two to two and one-half times more for heating his house with gas than with coal, but then we go on to describe the advantages derived by the elimination of dirt, etc., the saving in help, and so on.

First Experimental Installation

One of our first installations was in the home of a prominent Lynn merchant. This was more or less of an experiment and carried on under the direction of Mr. Elmer S. Stack, domestic hot water heating engineer. After an investigation had been made, it was believed that for spring and fall this customer's home could be heated at no greater expense than with coal, but for the winter months it would cost materially more. He was so informed, but after analyzing the many advantages of gas compared with coal, he instructed us to go ahead with the installation. The thing that appealed to him most was the fact that he could go away over night or even for a few days and not have to worry or even think of his fire.

Details of Installation

This installation was made in 1920 and consisted of a separate, specially designed heater which served as an auxiliary to the regular coal heater. It was placed alongside of the hot water boiler and was so connected that the turning of two valves would permit the use of either the coal or the gas heater. Figure 1 gives an idea of the design of this installation. The gas heater was constructed of four copper coils of a size to give sufficient heating surface to take care of the radiation required. These coils are

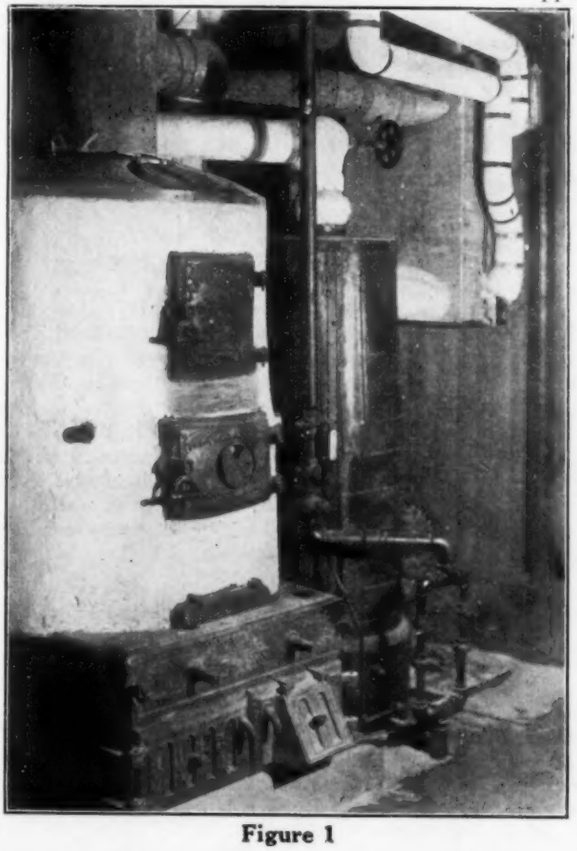


Figure 1

heated by a ring burner in two sections made of one-inch pipe, tapped and drilled for ten burners, of the same type as those used in instantaneous water heaters.

The gas passes from a twenty-light meter through a one and one-quarter inch pipe to the main cock and thermostat and thence to the manifold, which reduces to a one by one and one-quarter inch B. H. tee. The two one-inch branches reduce to one-half inch and then back to a one-inch line to the burner ring. In the one-half inch branches are two one-half inch gas cocks, so that half the volume of gas can be used in mild weather and full volume in cold weather. Seven hundred square feet of radiating surface are supplied by this installation through eleven radiators.

The house contains nine rooms and has a hall running from the first to the third floors, with all doors always wide open. The heater was built to operate with a thermostat. After a short trial an economizer was installed in the flue pipes and connected to a separate radiator in the dining room. This appreciably increased the efficiency of the gas heater and reduced the flue temperature to a point where you could comfortably hold your hand on the flue pipe at all times.

This heater is now being used for the fourth season and the original quantity of coal, which was in the bin when the gas heater was installed, is there today. The service has been more than satisfactory and accomplishes just what was desired, not only in giving greater freedom and relief from attending the coal heater, but also from the nuisance of coal and ashes in the cellar. The concrete floor has just been painted and is as free from dust and dirt as a kitchen floor.

Cost of Gas for Heating This House

No effort is made to conserve expense in this home, all rooms being heated to a uniform temperature of 70 to 72 deg. Fahr. at all times. The average gas bill per month from the time the heater was started in the fall until it was discontinued in the spring was $65. The minimum gas bill was $19.13 and the maximum $106.95, this with gas at 12½ cents per 100 cubic feet. To do the same work with coal required fifteen tons of anthracite per season, which today would cost $230, or $32 per month, as compared to the $65 given above.

Other House Heating Installations

Two other particularly interesting installations have been made, one in Marblehead and the other in Marblehead Neck. Marblehead is an all-the-year round town, while Marblehead Neck is strictly a summer resort, being a neck of land projecting out into the Atlantic Ocean, surrounded on three sides by water and connected to Marblehead by a narow causeway a half a mile long.

Each of the following installations were made after the design and under the supervision of Mr. Stack and were made in the old coal heaters for the customers did not wish to go to the expense of buying an extra heater, as they desired to use gas only, spring and fall. Both installations are hot water boilers, the first a Gurney No. 405 C round, with 25-inch firepot.

Converting Old Coal Heaters

On several previous attempts to apply gas to installations of this kind it was found that, due to the construction of the hot water boiler, a great amount of carbon collected on the cast iron heating surfaces so that gas proved very inefficient. To overcome this fault a specially designed coil was attached to the inside of the fire box. The bottom of this coil was connected to the return pipes on the outside of the heater and the top of the coil was connected directly with the header leading to the radiators, thus by-passing the main body of the heater and permitting the hot water to travel directly to the radiators. This method not only supplied an additional amount of heating surface but used the original surface as a collector of heat which otherwise passed up the chimney.

This installation was designed for hand control and was made up of suitable burner rings to which were fitted burners of the automatic instantaneous

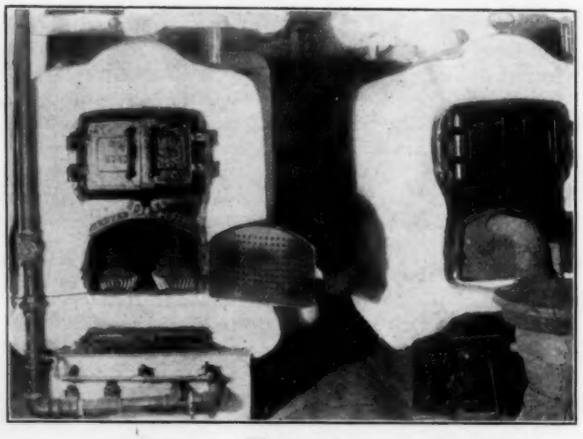


Figure 2

heater type. The burners were made in three sections and controlled by three separate shut-offs. The center ring burners were placed directly under the coil, while the outer ring burners were so placed that the gas flame impinged directly upon the cast iron heating surface.

Operation of Heater

The maximum amount of gas conducted by the outer burners is 600 cu. ft. per hour, while the center ring conducts 240 cu. ft. per hour. Within thirty

(Continued on page 528)

Making Prussian Blue Direct from Coal Gas*

How a useful by-product can be derived from coal gas

Achille Decleve

THE gas that is made in gas retorts or coke ovens contains cyanogen. Certain experimental work has proven that the cyanogen can exist in just two forms in this gas. It is present either as cyanogen itself or else in the state of hydrocyanic acid.

It is a well-known fact that cyanogen cannot exist in the gas as sulphocyanic acid (CNSH), for this compound is decomposed in the presence of hydrogen to yield hydrocyanic acid and sulphuretted hydrogen, in accordance with the following equation:

$$HCNS + H_2 = HCN + H_2S.$$

Then, again, it cannot exist in the form of ammonium cyanide, for that compound is decomposed at a temperature of 266 degrees C, which is exceeded in the gasification process. Furthermore, hydrocyanic acid is replaced in its salts and compounds by either carbon dioxide or sulphuretted hydrogen, both of which are always found in coal gas in sufficient quantities, and in fact in more than sufficient quantities to combine with all the ammonia that is present in the gas. Finally, experimental observations have shown that cyanogen does not exist in coal in the form of sulphocyanate of ammonia.

Origin of Cyanogen Compounds

When cyanogenated compounds are found in the condensate obtained from coal gas, the conclusion must be reached that these compounds are formed by secondary reactions which take place after the coal is gasified. Thus, the presence of ferrocyanide of ammonium in the ammoniacal liquors is explained by the fact that free hydrocyanic acid reacts in the presence of ammonia with sulphide of iron, which is itself produced by the action of the sulphuretted hydrogen, which is contained in the gas, on the iron of the pipes and scrubbers through which the gas is passed. This reaction takes place somewhat as follows:

$$6\ HCN + 6\ NH_3 + FeS = Fe\ (CN)_6\ (NH_4)_4 + (NH_4)_2S.$$

In a similar manner sulphocyanate of ammonia is produced by the action of carbon disulphide on the sulphide of ammonia, which is dissolved in the ammoniacal liquors. This takes place in accordance with the following equation:

$$(NH_4)_2S + CS_2 = 2\ H_2S + NH_4CNS.$$

Hence, if consideration is taken of the instability of free cyanogen in the presence of the various constituents of coal gas, it may be correctly concluded that the cyanogenated compounds in the gas are for the major part reduced to the form of hydrocyanic acid.

Importance of Extraction of This Compound from Gas

Hydrocyanic acid belongs to a family of chemical compounds which possesses considerable importance. Alkaline cyanides are consumed each year in thousands of tons for various purposes, particularly in the metallurgy of gold. The ferrocyanides have a number of different uses in the dyeing of textiles, in the synthesis of various intermediate chemicals, dyes, drugs and perfumes, and in metallurgy as well. Prussian blue is a pigment which finds many important applications in the leather industry, in the manufacture of blue print paper and wall paper and in making color pastes. The high price of this substance has limited its usage. The cyanogen and hydrocyanic acid that are contained in coal gas are raw materials from which it is possible to synthesize this substance. This has been effected in a practical way, both in Germany and England.

Furthermore, it must be remembered that it is very essential to remove as far as possible all of the cyanogen compounds that are found in the gas. Otherwise, serious difficulties are encountered in its industrial or domestic use. These ingredients of coal gas form very stable compounds with the purifying materials commonly used in gas practice, such compounds as alkali and iron ferrocyanides and sulphocyanides, which render appreciable quantities of iron oxide inert and prevent it from exerting its purifying action on the gas in the elimination of the sulphuretted hydrogen that is contained in it.

Various Processes Proposed

There have been several processes proposed for the removal of the cyanogen compounds from coal gas. But the great majority of these processes that have been evolved and used up to the present time have proven unsuccessful, because of the irregular quality and impurity of the products that were recovered by their use. Furthermore, the cost of producing the product was found in most cases to be too great to make the process of any commercial value.

The proper operation of processes of this char-

(Continued on page 535)

*Translated specially for the American Gas Journal from Chemie et Industrie.

GAS MERCHANDISING

Domestic – Industrial

How Are They Introduced?

Do You Use Letters to Help Your Salesmen?

William H. Matlack

THERE can be no denying the fact that, if the salesman calling on "clear-sky" prospects has in some way been introduced to these prospects, he is accorded a better reception than where nothing has been done save to turn him loose on a street containing a row of houses with women in them. The same may be said about the merchandise he is trying to sell. If some sort of introduction has been given the merchandise in the way of newspaper, direct mail or telephone advertising, the chances of its being sold are greatly enhanced. Consequently, if both the salesman and the merchandise have been introduced to folks by some form of advertising, the chances of either or both securing attention and arousing interest are doubly good.

Experienced merchandisers in the gas industry are rapidly turning their attention to the waste effort in selling, and one of the major faults that stands out and has to do with dissatisfaction and hence turnover, has been the waste of effort in calling upon prospective customers and going through an introductory talk about the merchandise and the company, to say nothing of the preliminary work in securing an open door.

Customer Should Know Goods Salesman Sells

Merchandisers who have made a study of the situation say that, if the merchandise and the plan upon which it is sold is known to the customer, or even if the customer is only aware that such merchandise exists and is being sold by the local gas company, the salesman has to spend less time per customer, and as a result makes more calls and sales per day. On the other hand, where the merchandise is unknown, the salesman is forced to give more time to each call, thus cutting down the number of calls and sales per day and hence decreasing his earning power.

Using a Slogan

The proper way to introduce the merchandise, of course, is by the continuous use of printers' ink, through newspaper, direct and personal advertising, by using the telephone and telling the plan upon which they are sold. One Southern company has recently adopted a slogan that is set in small type under the company's signature in each ad. This slogan is, "If it burns gas—buy it from us on the divided payment plan." It informs the prospective customer that the company is glad to have new accounts on the time payment basis and in a measure it cuts down sales resistance while the advertising introduces the merchandise being offered.

MACON GAS COMPANY
MACON, GEORGIA

March 24, 1924.

Dear Sir or Madam:

The sketch below represents a very efficient and economical hot water system developed by the best hot water experts of the country.

Twenty minutes after the burner is lighted there is sufficient hot water for a generous bath.

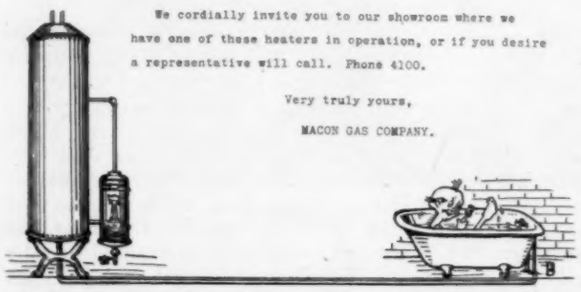
We are offering this hot water system including tank, water heater, pipe, fittings and faucets complete, connected to your bathtub ready for use at the extremely low price of $50.00 or $5.00 per month for ten months.

Living in a rented house need not stop you from taking advantage of this offer. The system can be readily disconnected and reconnected at another house at a small cost.

We cordially invite you to our showroom where we have one of these heaters in operation, or if you desire a representative will call. Phone 4100.

Very truly yours,

MACON GAS COMPANY.



Recently the Macon (Ga.) Gas Company conducted a water heater sale and used the local newspapers and the form letter produced below to introduce their salesmen. This gas company has brought out some new thoughts regarding the form letter and answered some of the questions the prospective customer is likely to want answered when he contemplates the purchase of a water heater.

What About the New Family?

How one gas company built a window display for brides

THERE is one market that the gas company can ill afford to pass up. That market is the new family market. Each year thousands of new families are created in this country. These "newly-weds" all keep house in some way and use some sort of gas appliance for cooking, if for nothing else, and for this reason the new family market is a good one to cultivate. Catch them young and instill in their minds the advantages of gas for cooking, heating and water heating, and as new appliances and new uses for gas service in the home are developed there will be no difficulty in selling them.

The Gas Light Company of Augusta recently installed a window display to attract the attention of these new families that is just a bit out of the ordinary and which may hold an idea for other companies who wish to capture the attention of the newly-weds.

Details of the Display

The display which we have illustrated here is a simple one which can be made at but very little cost. The following materials are used: One or two wicker flower baskets, a bunch of paper flowers, a few yards of cheese cloth and a cake or a couple of circular boxes iced-up to represent a two-layer cake, a yard or two of baby ribbon and a couple of yards of tulle. In the case of the window illustrated, Miss Cephalie Lewis, of the company's service department, made an honest-to-goodness cake and decorated it with colored icing formed to represent sweet peas, while Miss Bertha O'Keefe, of the accounting department, made the (paper) sweet peas to fill the baskets. The window, which is all in white, contained a single stove, the cake on a draped pedestal, and the three

baskets of flowers. A small sign, which was placed at the bottom of the pedestal and to which a ribbon was attached that ran to the gas range, told the whole story—"To Old and Young Brides."

This company believes in putting the human interest appeal into all forms of advertising, and in catching them young, if possible, but in catching them all the time. "If June is the brides' month," they ask, "why not get them to thinking about home equipment in time?"

Exact Business Knowledge Means More Appliance Business

The importance of knowing the sales per meter and the application of such knowledge

Frank H. Williams

HOW many gas meters are there in your town or city?

How much of any appliance business did you get from each meter on the average last year? (That is, what were your gas appliance sales in dollars and cents to each meter user on the average last year?)

How much of an increase in appliance sales per meter are you showing this year?

The answers to these questions are really fundamentally necessary if the appliance department of the gas company is to know just "where it is at" in the matter of old and new business and if it is to step ahead in getting more business in the way that it should.

Of course, there are plenty of appliance departments which have all this information in complete tabular form. But there are other companies where very little or no attention at all is paid to this sort of data. And there are still other companies where the data is incomplete and where it is kept in an entirely satisfactory manner.

Complete Sales Data Is Essential

The more complete the data, the firmer the foundation upon which the appliance department can work in going after more business per meter, which it should get and which it can get.

Suppose, for instance, that the appliance department of a certain gas company has all this information right up to the minute all the time and suppose that this information reveals the following interesting facts:

Number of meters in the city, 7,000.

Average sales of appliances per meter last year, $3.25.

Average sales of appliances per meter this year, $3.15, figured on the basis of sales made to date.

Number of different appliances handled by the company in its appliance department last year, 82.

Number of different articles and appliances handled by the company in its appliance department this year, 95.

Prices of articles and appliances handled by the appliance department this year, as compared with last year's prices, 6½ per cent higher.

How Information Can Be Used to Advantage

Now, from all of this, there is but one thing to be deduced, and that is that the appliance department is slipping and it is slipping quite speedily. This is evident because of the fact that the department is selling a smaller quantity of articles and appliances per meter than it did the previous year, and this, too, in spite of the fact that it is getting a higher price for the goods this year than last year.

But, without this concrete and specific analysis of just what the department is doing, the company could very easily "kid" itself into believing that it is doing better than ever.

How could this be the case?

Fallacy of the Total Business Figure

Why, because of the fact that the total volume of business done by the appliance department this year is considerably ahead of the total volume of business done by the department last year.

How can this be the case in view of the fact that the average sales per meter are smaller?

Simply because of the many new installations made by the company. The increased number of meters brings up the volume to a higher figure than ever, in spite of the smaller average sales per meter.

A situation of this sort means that there is a slackening up somewhere along the line which should be done away with if the company is to make progress.

Reasons for Reduced Sales Per Meter

This slackening may be due to a lessening of effort on the part of the salespeople. Or it may be due to the fact that the appliance department, in adding more articles and more appliances, has unwittingly pushed some of the best sellers into the background, with the result that the sales on these particular goods have dropped way off without anyone around the office being the wiser. Or, again, it may be due to the fact that the company, seeing its volume of business increasing and not realizing that it is really selling a smaller quantity of goods per meter than ever before, may have cut out advertising.

Suggested Remedies

The first thing to do in overcoming such a condition as this is to know just exactly what the company is doing. And, as has been said at the start of this article, the best way of knowing what the company is doing is by getting all the data which has been outlined in this article.

The next step is, of course, to go after more business HARD.

And here, too, an exact knowledge of what has been done and what can be done will be found to be of a tremendous help to the manager of the appliance department.

Important Sales Points Requiring Investigation

These are the sales points that should be investigated at once by the appliance department manager:

The present number and volume of sales on all the various articles and goods handled by the department as compared with the number and volume of sales on these articles and appliances during the previous year. This information will enable the appliance department to see whether the sales of some of the articles and appliances carried in the department are falling down. For instance, this investigation might show that at the present time the company is selling only 30 per cent as many heaters as were being sold during the previous year. Such a drop, of course, means that heaters are being slighted for one cause or another and that the company should push them more.

Various Sales Methods Used

What sales methods that were successful last year are being neglected this year? Very frequently, as has been suggested above, a gas appliance department whose total volume of business is increasing will figure that it is doing so well that it can dispense with certain proved promotion methods. For instance, one appliance department may cut down on the amount of newspaper advertising. Another may cut out a good part of the direct mail advertising. Still another may stop personal solicitation by phone. And so on.

What customers have purchased the smallest quantity of goods from the appliance department during the year? The smallest purchasers should, in theory, be the best prospects, so the appliance department should go after such people hard in the effort to sell them more goods.

All this sort of thing requires time and effort and thought. But it will be well worth while, as it will show the appliance department how and where to get more business. It will enable the department to show a satisfactory increase in business from month to month and from year to year.

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT YOU CAN DO IT BETTER WITH GAS

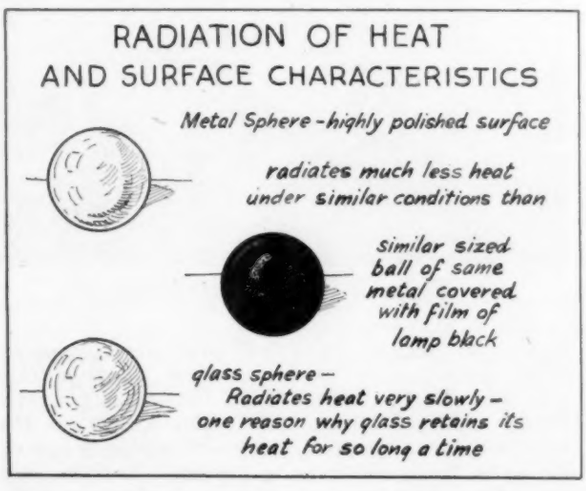
Lesson No. 23

The radiation of heat

IN measuring the radiation of heat it has been found that the character of the surface has a great effect on the rate at which heat is radiated by a body. It is not dependent on the form or the shape of the body. The only other factor that controls the radiation of heat by a hot body is the temperature of the same in comparison with that of its surroundings. It is also obvious that the amount of heat radiated will depend on the surface area of the body, but as the formulae that are used in determining radiated heat always express it in terms of B.t.u. per square foot per hour, this factor need not be considered.

The Nature of the Surface

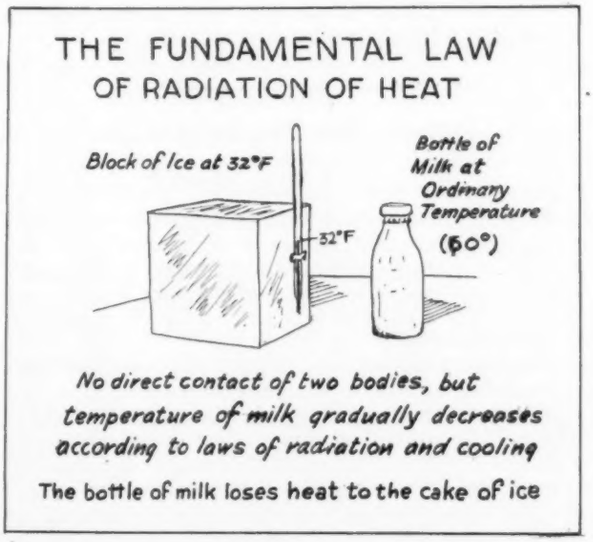
The most interesting characteristic of the heat radiation phenomenon is the effect of the character of the surface on the amount of heat that is radiated by the hot body. Thus, if two spheres of metal are heated to the same temperature and then allowed to cool, it can be determined by experiment that the sphere, which has a dull finish or which has been coated with a layer of lampblack, will cool off much more quickly than the one whose surface has been



highly polished. In fact, a black body, which may be assumed to be any carbon surface with the exception of the crystalline variety, that is, the diamond and graphite, will radiate heat more effectively than any other surface. In general, the more highly polished the surface, hence the greater its light (and also heat) reflecting capacity, the less heat will be radiated by it. The highly polished glass mirror surface is the worst of all radiating surfaces. This is the reason why surfaces are nickel plated or polished when it is desired to restrict their heat radiating capacity.

The General Law of Heat Radiation

In order to understand what happens in the radiation of heat from a body, it is well to remember the general law that every body radiates heat to the



others surrounding it, but that the hotter the body the more heat it radiates, depending, of course, on its own inherent heat radiating properties. If a body is warmer than those surrounding it, it loses heat and becomes lower in temperature, and when it is colder than the surrounding objects it receives more heat than it radiates and its temperature rises.

This explains what happens when a comparatively cold body is brought close to a cake of ice. The cold body is considerably hotter than the block of ice. The result is that this comparatively warm body radiates more heat to the ice than it receives from the latter, with the result that the temperature of

the warm body becomes less. Thus, from this phenomenon we learn that all bodies radiate heat all the time and they grow hotter or colder according to whether or not they receive more heat or less heat than they radiate.

The Laws of Cooling

The equations that express mathematically the laws of heat radiation are not as simple as they might be. The difference in temperature is of considerable importance and some equations are applicable just to certain ranges of temperature, beyond which others must be employed in order to secure accurate results.

The simplest equation is written in the following form:

$$Q = k\ (t_2 - t_1).$$

In this equation, Q is the amount of heat radiated by the body in B.t.u. per hour per square foot of surface; k is a constant which depends on the character of the surface of the body; t_2 is the temperature of the body in degrees Fahrenheit and t_1 is the temperature of the surrounding air. This simple relation expresses Newton's law of cooling in mathematical terms. In other words, it states that the amount of heat that is given off by a body within a unit period of time and for a unit area of surface is directly dependent on the difference in temperature between the body and its surroundings.

HOUSE HEATING BUSINESS

(Continued from page 522)

seconds from the time heat is applied to this specially designed coil, the water circulates into the header, whence it is distributed to the various radiators. This not only makes the heater much more efficient, but also increases the speed of application of the heat twenty to one.

The center burner only is generally used, and this is turned down so that the gas is consumed at a very moderate rate, depending of course upon requirements. The control by this method is entirely in the hands of the operator, as no thermostat is used. Of course, the highest efficiency is not obtained where the human element is involved in the regulation, but on the other hand we have found that where the thermostat is used to regulate the temperatures, maximum efficiencies are not realized. In our opinion there is yet to be devised some more efficient method of transferring the B.t.u.'s of the gas to the water and then controlling the temperature regulations throughout the house.

Results Obtained

The above described installation heats a house of thirteen rooms and one bath (825 sq. ft. of radiation) in about forty-five minutes, with all burners on full. The gas consumption is about 600 cu. ft. per hour. The gas averages close to 540 B.t.u. When the temperature of the house is raised to 70 deg. F. the outside burners are turned off and the center ones left on, being turned down to a minimum, consuming about 100 cu. ft. of gas per hour. In extreme weather the center burners may be turned on full, burning 240 cu. ft. of gas per hour and maintaining a house temperature of 70 deg. F.

Large House Heating Unit

Another installation was made in Marblehead Neck, which is a summer colony. The installation is in a residence of fifteen rooms and five baths and was made in October, 1923. The house was formerly heated by two hot water boilers of the sectional type, each having a fire box 27 inches by 36 inches. In each of these fire boxes were placed six Finn heaters, such as are used in Stack storage systems. Each of these Finn heaters is operated from a separate burner. The water outlets are tied together into a header from which a pipe is run directly to the house heating system. Besides these six independent heating units in the center of the boiler, there are burners placed on either side of the shell of the boiler, so arranged that the gas flame impinges directly on the cast iron sections and the burners placed on the old grate bar level, the grate bars having been removed. (See Fig. 2.)

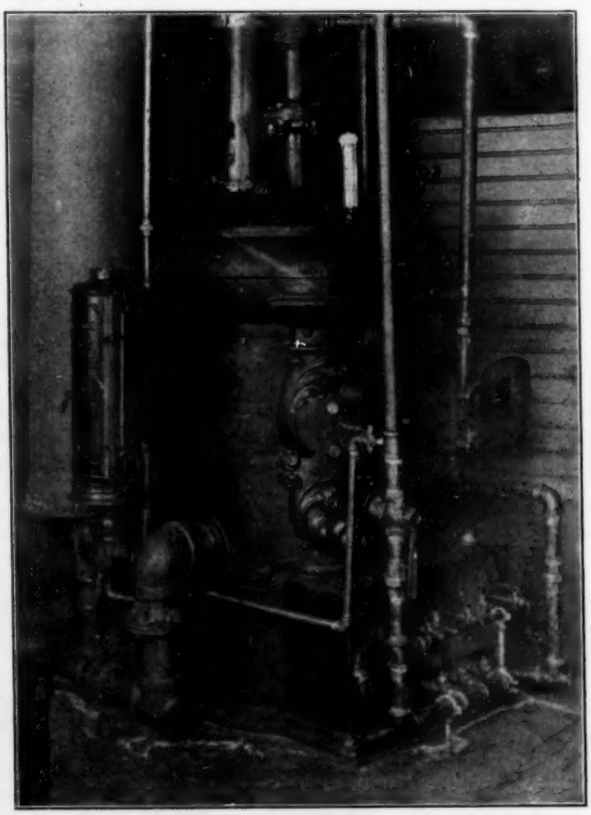


Figure 3—Garage Installation

(Continued on page 537)

As The Journal Views It

THE GAS MAN IN PUBLIC AFFAIRS

What is the gas man doing, as an individual, to interest himself in the public activities in his community? Is it wise that he should do so? What benefits are to be derived, both by the individual, the company, and the community itself, from such participation? Shall the gas man emerge from his proverbial exclusion and take active part in the communal affairs of the city or town which is served by his company?

These are rather important questions, and naturally they apply as well to all the other public utilities as to the gas industry. Due partly to the fact that in the early days of the utility industry, the participation of utility men in public affairs produced adverse results, and eventually became decidedly detrimental to the best interests of the utility, the utility man, particularly the gas man, has within recent times religiously kept himself away from public matters. He has, in a certain sense, been eliminated from this field.

The question has again been brought up and definite opinion has been expressed by an executive of a large Southern utility company on the advantages and disadvantages that may accrue from the renewed entrance of the public utility man into public affairs. It has been said that this can result in considerable advantage both to the utility man, the utility company and the community.

Of course, it is not meant that the utility companies should again enter political affairs. Neither is it implied that the gas company should participate as a company. It has, however, been suggested and recommended that the gas man, as an individual, and not as a representative of a company, or an officer of a public utility organization, should interest himself in what is going on in his community. He should, it has been said, use his training and his knowledge which he has acquired in his daily work in serving the public, to assist in the management of the public's business.

It is very hard to say whether such an action will result in good or in bad. There is certainly no reason why a public utility man should be ostracized, so far as public affairs are concerned, simply because he belongs to an organization that serves the public, and is more or less under public supervision. There is no reason why any gas man, or utility man, cannot hold office in a community as an individual, and give that community good, efficient, honest service. That the knowledge that he has gained and the training he has acquired, will be of advantage to the community, cannot be gainsaid. He certainly is more fitted for such work than the average business man, or lawyer; he knows better how to deal with the public, for the utility comes in contact with all the people in the community at some time.

But, it may well be argued that even if the gas man enters public life as an individual, the same way that a lawyer does, or any other business man who aspires to public office, even if he does keep his identity separate from that of the company with which he is connected, it is possible and perhaps probable that the average citizen will not divorce his actions from his relationship with the utility company. It is possible that if the gas man should hold public office he might be accused by those who are ready to say the worst without knowing much about anything that he is using his office for the benefit of the utility, and, as is known, gossip plays havoc with reputations, even when that gossip is entirely false.

What can be the effect of the entrance of the gas man into political affairs, on the gas company? That is the important question, and unless it is absolutely certain that the work, that the gas companies have been doing, to build up public good will, to stimulate public friendship and secure the confidence of the people that they serve, unless it is positive that all this good work will not destroy, it would perhaps be more discreet for the gas man to keep himself aloof from public affairs.

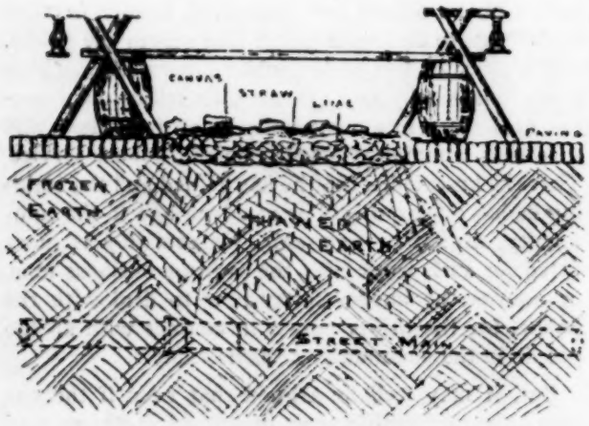
Of course, this may be unfair to the man, but, as has often been said, in entering a gas organization, or any public utility organization, a man must give up some of his freedom. He must sink some of his in-

GAS WRINKLES

LIME FOR THAWING IN WINTER STREET WORK

The following scheme is well worth bearing in mind for use during the coming winter, should it be desired to draw the frost from frozen ground in order to get at a pipe beneath:

At the spot where it is determined to dig, lay out the size trench desired, and pick out the frozen surface to a depth of eight or ten inches. In the hole



so made, put in enough unslaked lime to make a good thick bed of it.

Do all this in the evening, if possible, and, upon leaving, throw such a carefully judged quantity of water over the lime as will start it to slaking and yet will keep it "working" for the longest time possible during the night. Throw a lot of straw, if possible, and a canvas over the whole, weighting it with stones and boards, etc., around the edge, to keep the heat in.

GAS TRAP FOR REMOTE AUTOMATIC CONTROL TO GAS BURNERS

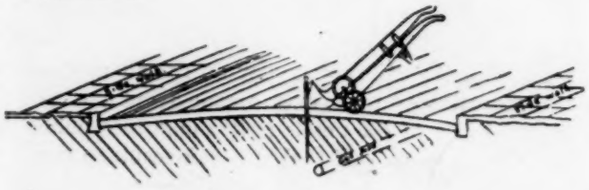
F. H. Pelle, San Francisco, Cal.

In order to prevent the gas in the line, between an automatic control valve and the burner of an appliance, from gradually escaping and allowing air to enter the pipe, this gas trap was installed immediately ahead of the burner.

This is paritcularly desirable where the burner is some distance from the automatic control because without the trap the gas contained in the pipe between the burner and the valve is replaced with air after the valve has been shut off for several hours and when the valve is again opened this air is blown through the burner, extinguishing the pilot, or, if the gas in the pipe between the valve and the burner is only partially mixed with air and explosive mixture is sometimes obtained which explodes when the valve is opened, which also has a tendency to extinguish the pilot light and cause the burner to back fire.

TRUCK FOR PULLING BARS

These ideas that crop out from that mother of invention, necessity, are the day dreams of one's think tank—that mystery, that womb of thought, man's brain. It is said that great minds seek the same channels, as you will observe, putting wheels to a lever that is used for drawing bars in street work. It was represented at the last Western Association meeting. We allude to cut No. 123. It needs no explanation.



dividuality in the interests of the organization that he serves. And it may mean that he has to give up all hope of holding political office or participating in public affairs. It is again emphasized that this is unfair and unjust, but it must again be recalled to mind that a situation may well arise in which it would not require considerable imagination to predict what would happen if the public utility man in office offended some politician, or some citizen who craved a favor, or lost his popularity by an honest but disliked action. It might well result to the injury, not only to the man, but also to the organization of which he was a member.

Thus, the question as to whether or not the gas man, or the public utility man in general, should take an active interest in public affairs is still a much mooted one. That he has a right to do so, an inalienable right as a free citizen of this country, goes without saying. But there still remains this essential consideration: Will the public utility be injured by such action? If there is any such possibility, it were far better he did not participate and that he remain aloof from public activities as he has been for the years past.

Catechism of Central Station Gas Engineering in the United States

Installment No. 23

(Continued from last week)

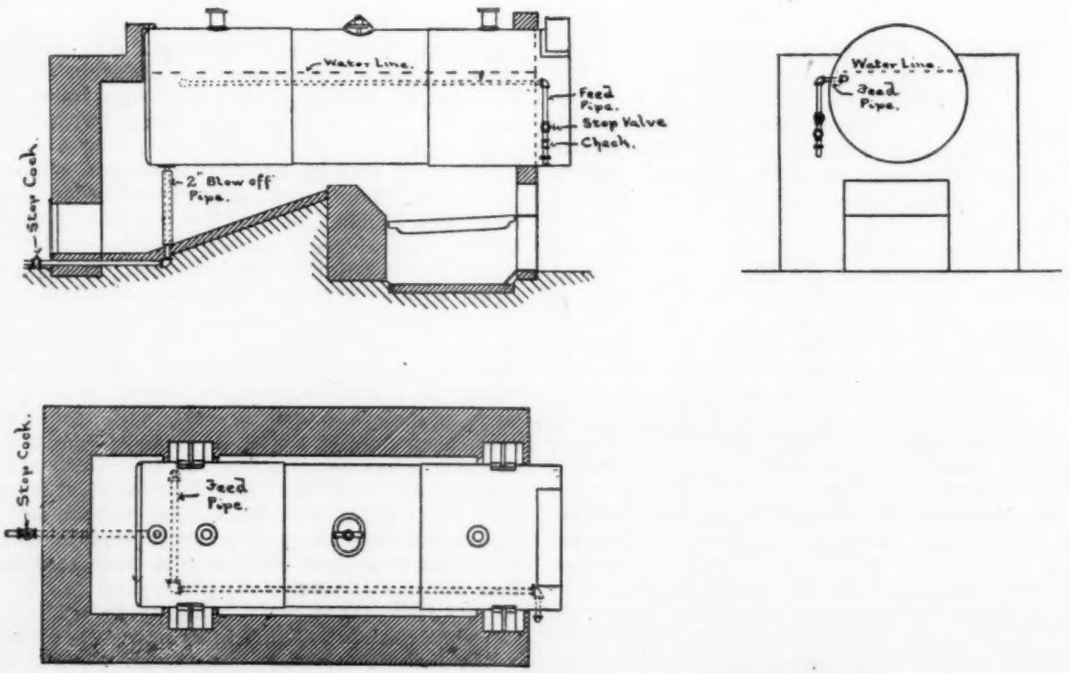
Gate valves are open to the objection that scale can accumulate in the depression into which the bottom of the valve fits when it is closed and thus prevent the valve from closing tight. In spite of its tendency to stick, a full opening stop-cock forms the best shut-off for a blow-off pipe, but it must be opened full every time the blow-off is used, and care must be taken to shut it slowly to avoid subjecting the pipe to the great increase of pressure produced when the flow of water is stopped abruptly by the sudden shutting of the stop-cock, since this pressure will sooner or later cause a burst, either in the pipe or in the fittings through the strain which it throws upon them. A tee should be inserted in the blow-off pipe just behind the cock so that its tightness when closed can be determined by taking the plug out of the side outlet of the tee and observing whether any water is trickling through the pipe. A tight joint should be made between the end of the blow-off pipe and the drain into which it is led to prevent the hot water splashing back on the boiler attendant. The blow-off pipe should be of good size, at least 2 in. in diameter.

Furnace for Horizontal Tubular Boiler

125. Give a description, illustrated with sketches, of some form of furnace for horizontal tubular boilers adapted to give a good evaporation per pound of gas coke.

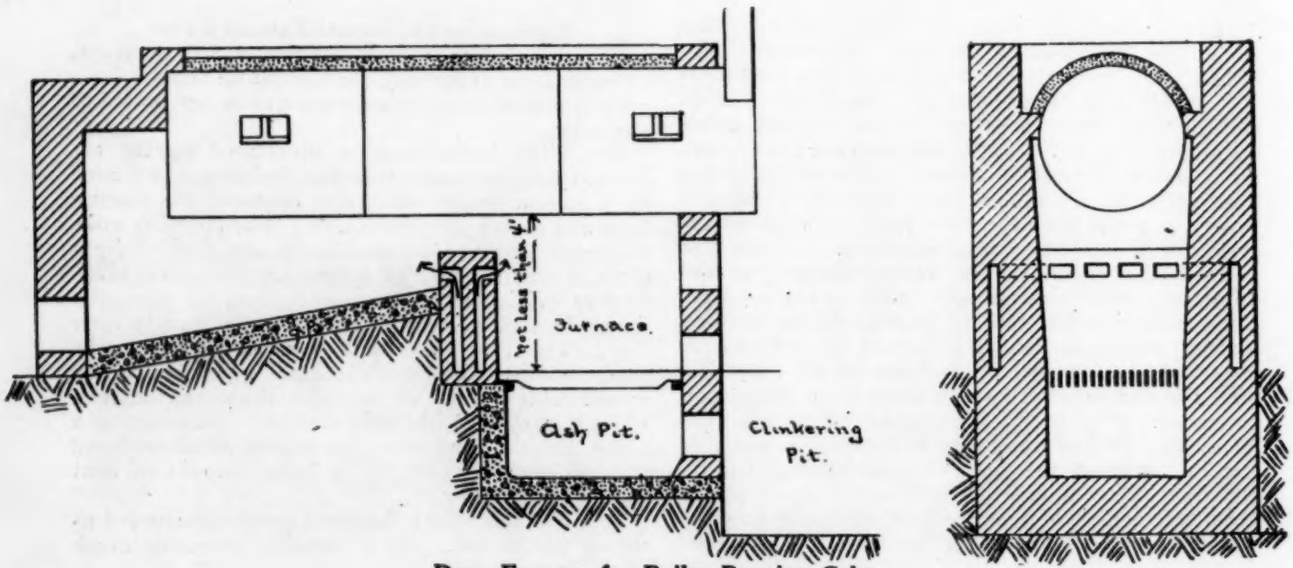
Ans. The boiler furnace illustrated on the accompanying cut is one that was designed and is used by a gas company which also operates the electric light and power plant in its city. When burning coke in the ordinary boiler furnace in the electric light plant it was found that a comparatively low evaporative efficiency was obtained from it, especially when the boilers were being worked at nearly their rated capacity. The reason for this seemed to be that, owing to the open character of a coke fire, a considerable excess of air was drawn through it when burned with the thin fuel bed customary in a boiler furnace, and that this excess of air reduced the efficiency by carrying a large amount of heat out of the chimney.

To avoid this effect, furnaces were constructed as shown on the cut. These furnaces are made much



Feed Water and Blow-Off Connections for Horizontal Tubular Boilers

deeper than the ordinary ones, the distance from the grate bars to the bottom of the boiler being not less than four feet. It is thus practically a generator furnace. The primary air is admitted through the ash pit in the usual way and a supply of secondary air enters through the two air ports, one in each side wall of the furnace just below the boiler front. Each port opens into a flue in the side wall which runs back to the bridge wall, and into two flues in this wall. From one of these the air escapes by openings to the front and from the other by openings to the back, as shown on the cut. The secondary air required is thus delivered, from both the front and the back of the bridge wall, to the gas produced in the deep fuel bed. The amount of secondary air admitted must, of course, be proportioned to the amount of gas being produced in the furnace.



Deep Furnace for Boiler Burning Coke

While with the ordinary boiler furnace coke had been found to give evaporative results from 10 to 15 per cent lower than those obtained from steam coal in the same boilers, when the furnaces described were used the evaporative efficiency of the coke was brought up to an amount equal to that of the coal. The work of firing with this furnace is stated to be easier than with steam coal and the ordinary grate. The repairs are small and the fire has to be clinkered only once in a day of twenty-four hours.

Grate Surface Area in Horizontal Return Tubular Boiler

12. How much grate surface should be allowed in setting a horizontal return tubular boiler 4 ft. 0 in. in diameter and 16 ft. long and containing forty-eight 3 in. tubes? Consider that gas coke will be the fuel used, and give the reasons for your answer.

Ans. Since the rate at which the fuel can be burned, and consequently the rate at which steam can be made in a boiler, depends upon the amount of grate surface, this surface should be as large as is consistent with the efficient utilization of the heat produced in the furnace. To utilize the heat efficiently it is necessary to have ample heating surface in proportion to the grate surface, so that the products of combustion will come in contact with sufficient heating surface to be well cooled down before they escape to the chimney. The area of grate surface should therefore bear a certain relation to that of the heating surface, and it has been found by experience that this relation varies with different classes of fuel. With fuels containing a comparatively large amount of volatile matter, which burn with a long flame, it is necessary, in order to secure the same efficiency, to have more heating surface per square foot of grate surface than is required with fuels which contain no volatile matter, and so burn either with no flame or with a very short one. From the information gained from the results of a great number of boiler tests, Mr. G. H. Barrus states that the best results with bituminous coal are obtained when the heating surface is from 45 to 50 times as large as the grate surface, while with anthracite the ratio need only be 36 to 1. Coke is similar to anthracite in having all the carbon fixed but since lump coke burns more freely than anthracite, it is well to take a higher ratio for the heating surface and make heating surface divided by grate surface equal 40. For coke breeze, which makes a more compact fire that burns less freely, the proportion can be made 30 to 1, the larger grate being necessary to enable the same quantity of fuel to be burned per hour.

The heating surface of the boiler covered by the question can be found by the following rule, given in Kent's Mechanical Engineers' Pocket-Book:

Calculating Heating Surface Area

"Take the dimensions in inches. Multiply two-thirds of the circumference of the shell by its length; multiply the sum of the circumference of all the tubes by their common length; to the sum of these products add two-thirds of the area of both tube sheets; from this sum subtract twice the combined area of all the tubes; divide the remainder by 144 to obtain the result in square feet."

The boiler being 4 ft. 0 in., or 48 in. in diameter, two-thirds of the circumference of the shell is equal to $\frac{48 \times 3.14 \times 2}{3} = 100.48$ in., and the length of 16 ft. 0 in. is equal to 192 in. The product of these figures is 19,292.16. The circumference of a 3-in. tube is 9.42 in., so the sum of the circumferences of 48 tubes is $9.42 \times 48 = 452.16$, and $452.16 \times 192 = 86,814.72$. $19,292.16 + 86,814.72 = 106,106.88$. The area of the tube sheet, which is 48 in. in diameter, is 1,809.6 sq. in., and of the two sheets twice this, or 3,619.2. Two-thirds of 3,619.2 is 2,412.8, and $106,106.88 + 2,412.8 = 108,519.68$. The area of a 3-in. tube is 7.07 sq. in. and twice the area of 48 tubes is equal to 7.07×96, or 678.72. $108,519.68 - 678.72 = 107,840.96$, and $\frac{107,840.96}{144} = 748.90$. That is, the heating surface is 748.90 sq. ft.

Taking the grate surface as 1/40th of the heating surface, we have as the area of the grate for lump coke $\frac{748.90}{40} = 18.72$ sq. ft., while for breeze it would be $\frac{748.90}{30} = 24.96$ sq. ft.

In gas works, where breeze is certain to be used, more or less, the grate should be made of the larger area, which can be reduced at any time if lump coke is to be used as a regular thing.

Furnace of Horizontal Return Tubular Boiler Suitable for Burning Coke Breeze

127. Give a description of a furnace and setting for horizontal return tubular boilers suited for the use of coke breeze as the boiler fuel, and state how you would obtain the draft required for the combustion of the fuel.

Ans. Provided there is sufficient draft to overcome the greater resistance caused by the more compact nature of the fuel bed formed by gas coke breeze as compared with that formed by either coke or coal, breeze can be burned with fair economy in an ordinary horizontal return tubular boiler setting under natural draft. It is necessary to have a grate with openings small enough to prevent the breeze from falling through, and it is well not to have the grate too far below the boiler, say from 2 ft. 0 in. to 2 ft. 6 in., since the breeze burns with a short flame and should be used in a thin bed. When the breeze is put in a little at a time and the fire kept thin and clean, fairly good results can be obtained with a furnace of this kind.

Operation of Furnace

But natural draft is necessarily strongest on top of the fire, and when a sufficient vacuum is maintained above a breeze fire to enable enough air to come through the fuel bed to produce the heat required to work the boiler up to its capacity, the products of combustion pass through the combustion space under the boiler and through the tubes at so high a speed that they pass into the chimney at a temperature too high for the greatest efficiency of evaporation. This high velocity of the products of combustion can be avoided by the use of forced draft, the resistance of the fuel bed being overcome by the pressure produced under it, while the conditions on top can be kept adjusted for the most economical working. The forced draft can be obtained either by the use of a fan blower or by means of a steam jet blower, and the current of air may be delivered into the closed ash pit of an ordinary setting, or through special, hollow, perforated grate bars. When a steam jet is used the steam is superheated by carrying the pipe through which it flows along the bottom of the boiler where it is exposed to the hot products of combustion. When a fan is used the air is often preheated by being made to pass through flues in the side walls and bridge wall.

A good form of steam jet blower installation is made by the Parsons Manufacturing Company. In this the steam pipe is carried along the bottom of the boiler to the back of the setting and the air is delivered from the back under the grate just in front of the bridge wall, through which the air passes. The grate is made of iron plates perforated with a number of small holes.

The "White" grate is a type of the installations using a fan blower and hollow, perforated grate bars, the blast passing into the grate bars from a header with which they are connected.

Except for the special form of grate used and the provision of forced draft, the furnaces and settings are practically the same as those ordinarily employed for horizontal return tubular boilers.

Boiler Horse Power

128. Boilers are often rated as being of so many horse-power. What is the meaning of the term "horse-power" when used in this connection? What is the meaning of the same term when applied to steam engines?

Ans. The term "horse-power" as applied to the rating of boilers is used in two different ways; either as an absolute unit, by which to measure the rate at which the boiler will work, or as an approximate measure of the capacity of the boiler, to be applied in buying, selling, or describing it for trade purposes.

The trade or commercial horse-power is determined according to certain arbitrary assumptions from the dimensions of the boiler, the extent of the heating surface being usually employed for this rating on a basis of 12 sq. ft. of such surface for each horse-power. Thus, a boiler having a heating sur-

face of 1,200 sq. ft. would be ordinarily rated as being of 100 horse-power. The practice in this respect is, however, not uniform, and it is necessary when comparing different ratings of boiler capacity, especially in passing upon proposals for the supply of new boilers, to know upon what rule each rating is based. A rough-and-ready rule for approximating the commercial horse-power of either tubular or water tube boilers has been given by the "Engineering News" as follows: "Multiply the number of tubes by their length in feet and the product so obtained will be the horse-power of the boiler." The commercial horse-power is also sometimes determined from the grate surface, from one-quarter to one-half of a square foot being allowed per horse-power according to the kind of fuel used and its quality.

Official Definition of Boiler Horse Power

When used in engineering work for an accurate measure of the rate at which a boiler will do work, the term "horse-power" has been defined by a committee of the American Society of Mechanical Engineers as meaning "an evaporation of 30 lb. of water per hour from a feed-water temperature of 100 deg. F. into steam at 70 lb. gauge pressure, which shall be considered equal to 34½ units of evaporation, that is to 34½ lb. of water evaporated from a feed-water temperature of 212 deg. F. into steam at the same temperature. A boiler should only be rated at the power which it is capable of developing with easy firing, moderate draft and ordinary fuel while exhibiting good economy, and should be capable of developing at least one-third more than its rated power to meet emergencies."

When applied to steam engines, the term "horse-power" is used to indicate the rate at which mechanical work is done, and denotes the performance of work at the rate of 550 foot pounds per second, or 33,000 foot pounds per minute. A foot pound of work is the work done in raising a weight of 1 lb. through a height of 1 ft., or of overcoming a resistance of 1 lb. through a distance of 1 ft., or of overcoming any smaller or larger resistance through a correspondingly greater or less space.

Determination of Weight of Water Evaporated

129. How can the weight of water evaporated per pound of fuel by a boiler under ordinary working conditions be determined approximately?

Ans. An approximate determination of the weight of water evaporated per pound of fuel consumed by a boiler, under ordinary working conditions, can be made by measuring the water fed to the boiler during any period of regular operation, and weighing the fuel used during the same period. The water line should be at the same height and the fire in practically the same condition at the end of this period as they were at the beginning.

An easy way of measuring the water fed to the boiler is to put a water meter on the feed water pipe, between the feed pump and the feed water heater, if one is used, so that all water put into the boiler, and only the water so used, passes through the meter. The weight of a cubic foot of the water used at its ordinary temperature having been obtained by drawing off and weighing a sufficient number of samples to get a fair average, the volume of water used, as shown by the meter readings, can then be multiplied by this weight of unit volume to find the weight of water used. This total weight, divided by the weight of fuel consumed, gives the weight of water evaporated per pound of fuel.

Method Is Accurate

If the feed water connections between the meter and the boiler are kept tight and the meter kept correct by periodical testing, this method will give fairly accurate results. It is useful for determining which one of several fuels, purchased at different prices, is really the most economical to use, without going to the expense of making a number of complete tests in which every precaution is taken to insure extreme accuracy. When kept in use continuously, the meter being read every day at a regular time, and approximately the same amount of fuel kept in stock, it is also valuable as a check upon the quality of the work of the fireman. In this way alone it will more than repay the slight cost of the extra meter and connections, and the time required for making the necessary observations and calculations.

Action of Simple Single Cylinder Steam Engine

130. Give a brief description, illustrated by sketches, of the action of a simple single cylinder steam engine, explaining especially the setting and action of the eccentric and slide valve.

Ans. By referring to the diagrams on the cut, the action of the single cylinder steam engine can be readily understood. These diagrams show in outline cylinder, piston, ports, crank, eccentric and slide valve, P being the piston, SS the steam ports, E the exhaust port, C the crank, Ec the eccentric and V the slide valve.

In Fig. 1 the piston is shown in the position occupied at the completion of a stroke from right to left. The slide valve is so situated with reference to the ports that steam is being admitted through the left hand steam port to that portion of the cylinder on the left of the piston; while that on the right is open to the exhaust through the right hand steam port, the exhaust cavity of the valve and the exhaust port. The entering steam therefore forces the piston to the right, and with it moves the piston rod, connecting rod, crank and shaft, from which latter, motion is imparted to the valve through the eccentric, eccentric rod and valve stem.

(Twenty-fourth Installment Next Week)

MAKING PRUSSIAN BLUE DIRECT FROM COAL GAS

(Continued from page 523)

acter depend on numerous circumstances. There are many chemical, mechanical and physical details which have to be understood and controlled, for the success of the entire operation is bound up with them.

The Bueb Process

In fact, all the various processes of direct extraction of hydrocyanic acid from coal gas appear to have been abandoned in favor of the Bueb process. This process permits the recovery of a slimy mixture, composed of complex iron salts and combinations of ammonia and cyanogen held in suspension in an ammoniacal liquor. After the ammonia has been eliminated from these slimes they are filtered and desiccated and a final product is obtained which contains only a small percentage of valuable matter, thus approximately 30 per cent of Prussian blue, 44 per cent of cerrocyanide of ammonia and about 4 per cent of ammonia in the form of sulphate of ammonia.

The abandonment of direct extraction processes for the recovery of hydrocyanic acid, with the purport in mind of preparing alkaline ferrocyanides, has been due in a large part to the high cost of working them. For large quantities of dilute liquors have to be handled and concentrated, which is a very laborious work and very costly as well. Furthermore, during the transportation of these liquors from place to place around the plant, it was also found that an appreciable quantity of hydrocyanic acid was converted into sulphocyanates of little value.

But a careful examination and study of this matter led to the conclusion that it is advisable to remove the hydrocyanic acid from the coal gas before it enters the purifying boxes, if this can be done in a commercial manner. It is logically much more preferable to do this than to try to extract the small amount of cyanogenated substances that are present in the spent purifying mass after it has been employed in cleansing the gas.

The New Process

The new process has for its purpose the direct production of Prussian blue of commercial grade from the cyanogen compounds contained in coal gas. It is based on a preliminary study of the complex reactions that take place when the gas is passed through the aqueous mixture of ferric salts and alkalies. After these reactions were determined, those which were detrimental to the success of the process were eliminated and those which were conducive towards the production of a pure Prussian blue were promoted. In this manner a product was obtained which possessed a real commercial value, being of a high grade of purity.

Reactions Entering Into the Process

When an alkaline solution is mixed with a solution of a ferrous salt, a precipitate is formed in accordance with the following equation, where the symbol M stands for the alkali metal:

(1) $2\ MCH + FeSO_4 = M_2\ SO_4 + Fe\ (OH)_2$.

If coal gas is bubbled through the alkaline solution, which holds the ferrous hydrate in suspension, a sulphide of iron will be formed in accordance with the following reaction:

(2) $Fe\ (OH)_2 + H_2S = FeS + 2H_2O$.

The sulphide of iron, which is held in suspension in the solution, coming in contact with the hydrocyanic acid contained in the coal gas, reacts with the latter to form an alkaline ferrocyanide, in accordance with the following equation:

(3) $FeS + 6\ HCN + 4\ MOH = M_4\ Fe\ (CN)_6 + H_2S + 4\ H_2O$.

But at the same time there are certain secondary reactions which take place simultaneously and which must not be overlooked. The equations of these reactions are as follows:

(4) $2\ MOH + H_2S = M_2S + 2H_2O$.

(5) $MOH + HCN + H_2S = MCNS + H_2O + H_2$.

Detrimental Effects of Bye-Reactions

A part of the hydrocyanic acid is thus converted into the sulphocyanide, which tends to react against the efficiency of the process, while the liquor becomes loaded with sulphuretted products, which are capable of giving an entire range of instable products, such as polysulphides, hyposulphites, and the like, through the oxidation of the aforementioned sulphuretted substances.

Illuminating gas is never free from oxygen due to the leakage of air into the various parts of the purification and distribution apparatus. The effect of the oxygen in the coal gas is to promote the formation and deposition of free sulphur. This takes place in accordance with the following reaction:

(6) $H_2S + O = H_2O + S$.

Oxygen can also react with sulphuretted hydrogen in the presence of ferrous hydroxide, as is indicated in the following equation:

(7) $H_2S + 2\ Fe\ (OH)_2 + O_2 = Fe_2\ (OH)_6 + S$.

Action of the Free Sulphur

The deposition of free sulphur is not in itself of any great consequence, but the presence of this elemental substance gives rise to another series of reactions which are of importance. Thus, for example, the free, moist sulphur combines with the monsulphide of iron to form polysulphides which contain more or less sulphur and which no longer possess the capacity of reacting with hydrocyanic acid. On the other hand, sulphocyanic acid is formed through the agency of sesquisulphide of iron. The reactions that take place are depicted in the following equations:

(8) $2\ FeS + S = Fe_2S_3$.
(9) $Fe_2S_3 + HCN = HCNS + 2\ FeS$.
(10) $Fe_2S_3 + FeS = Fe_3S_4$.
(11) $Fe_3S_4 + S_2 = 3\ FeS_2$.

Prevention of the Secondary Reactions

In order to avoid as far as possible the formation of intermediate products which are of no value in the process and which in fact are a decided detriment to it, it is necessary to take the following precautions:

1. To avoid using caustic alkalies and to use a salt formed from a weak acid in such a manner that the latter can be substituted by the ferrocyanic acid which is formed in the midst of the liquor. While this is going on, sulphuretted hydrogen is prevented from entering into combinations with the alkali.

2. To avoid getting air into the coal gas as far as possible, great care must be taken to prevent this from happening as when the coal gas contains no oxygen, derived from the air, there is no deposition of sulphur and the consequent reactions do not take place. In fact, the most troublesome impurities that are derived from the gas and that get mixed up with the ferrocyanides, etc., are the cyanogen derivatives in which sulphur is contained. It is also known that action of the acids on the polysulphides also tends to produce deposits of sulphur, which makes a veritable cycle of the entire process. The reactions may be expressed as follows:

(12) $Fe_2S_3 + 2\ H_2SO_4 = 2\ FeSO_4 + H_2S + S$.
(13) $FeS_2 + H_2SO_4 = FeSO_4 + H_2S + S$.

Practical Details of the Process

The various phenomena, which have been briefly discussed above, led to the selection of a number of means which had for their purpose the avoidance of the accumulation of free sulphur or in fact combined sulphur in the reacting mass and the formation of sulphocyanides. The details of the process are described shortly below:

1. The ferrous salts that are in solution, when they come in contact with alkaline carbonates also in solution, first give an insoluble ferrous carbonate. This salt, which is unstable in the presence of water, is quickly changed into ferrous hydrate, ($Fe(OH)_2$). This compound in the presence of sulphuretted hydrogen, behaves in the manner illustrated in equation 2; that is, it reacts to give a monosulphide which then also reacts, as shown in equation 3, to give an alkaline ferrocyanide.

2. Inasmuch as the presence of caustic alkalies as well as alkaline sulphides is to be avoided because of the bad results that it brings about, it is advisable first to rid the coal gas of its ammonia content before proceeding with this process.

3. The increase in the temperature of the mixture of alkaline and ferrous compounds has the effect of promoting the following reaction:

$Na_4\ Fe(CN)_6 + 3\ S_2 = 4\ NaCNS + Fe(CNS)_2$.

This reaction evolves only a slight amount of heat and takes place only with great difficulty in the cold.

It is therefore necessary to carry out the operation at the ordinary temperature.

4. The presence of oxygen and oxidizing agents, as has been explained, enhances the formation and the deposition of free sulphur. Hence it is necessary to use ferrous salts, which are as free as possible from ferric salts.

When these conditions are realized in practical work, bubbling the coal gas through ferrous-alkaline solutions until the latter are saturated with hydrocyanic acid, cyanated muds are obtained which are composed of a solution of carbonate and alkaline ferrocyanides and sulphate, derived from the decomposition of the ferrous sulphate, which is originally present in the reacting mass. These muds also contain a little sulphocyanide which forms in spite of all precautions that are taken to avoid its being produced. The solution holds in suspension sulphides of iron which are rich in sulphur. These compounds are no longer attacked by hydrocyanic acid, and, as is known, are formed from the reactions which are due to the presence of free oxygen in the coal gas.

Separation of the Iron Sulphides

The separation of these iron sulphides from the solution that contains the ferrocyanide, is a delicate operation and must be carried out in such a manner that the sulphur, which is present in the solution in the form of unstable hyposulphites and sulphites, is conserved. The first operation is to convert the unstable compounds into the form of more stable substances.

In order to do this the solution must be agitated in the cold with an appropriate oxidizing agent, such as air, by blowing the same directly into the liquid. The sulphides of iron are decomposed. Ferric oxide is formed and sulphur is liberated, while the sulphuretted hydrogen which is led into the solution during the course of the treatment of the gas, is converted into sulphuric acid and then into alkaline sulphates. The equations, which indicate the various reactions that take place in this process, are given in the following:

$2\ FeS + 3O + 3\ H_2O = Fe_2(OH)_6 + 2\ S$.

$Fe_2S_3 + 3O + 3\ H_2O = Fe_2(OH)_6 + 3S$.

$H_2S + 2O_2 + Na_2CO_3 = Na_2SO_4 + H_2O + CO_2$.

$Na_2S + 2O_2 + Na_2CO_3 = Na_2SO_4 + Na_2CO_3$.

Separating the Precipitate

When this operation is finished it is an easy matter to separate the precipitate that has formed from the mixture of sulphur and ferric oxide on the one hand and from the solution on the other hand. As far as the latter is concerned, it is expedient to precipitate the soluble ferrocyanide in the form of insoluble ferric-ferrocyanide or Prussian blue, which can be obtained of good quality by just the ordinary technical operations.

The precipitate of sulphur and ferric oxide is treated with dilute sulphuric acid. Insoluble sulphur is obtained in this manner which is separated by filtration, as well as a solution of ferric sulphate which may be used for the oxidation of ferrous ferrocyanide into ferric ferrocyanide or Prussian blue.

Advantages of the Process

The advantages which are claimed for this process of obtaining Prussian blue direct from coal gas in the purification process are summed up as follows:

1. All the hydrocyanic acid which is mixed with the coal gas is recovered.
2. The formation of inert compounds in the mass of purifying material is avoided. These inert compounds are without any action on the sulphuretted hydrogen in the coal gas and hence do not remove it from the latter.
3. A Prussian blue pigment is obtained directly from the gas. This pigment can be utilized in the condition it is recovered. At the same time a small amount of sulphur is recovered, which reduces the work of the purifiers. Furthermore, ferric sulphate is obtained in sufficient quantity to assure the oxidation of ferrous ferrocyanide into the ferric compound.
4. Sulphocyanide salts, which are of little value, are prevented from forming, which removes the necessity of reconverting them later in case they do form.

The author claims that of all the processes of manufacturing Prussian blue this is the most economical.

Apparatus Required in the Process

The apparatus that is required for carrying out this process is of no consequence. It is necessary to have a rotary washer of the standard type, provided with three separate compartments, for washing the coal gas. Several tanks are also required. One, or, better, two filters for carrying out the filtration operations and a dryer are necessary. This completes the equipment required for this process. Of course, a pump or two is essential for transporting the liquirs from place to place.

As has been indicated above, it is necessary first to free the gas from its ammonia content. Modern installations which operate on the semi-direct sulphation process are particularly well suited for adaptation to this process. It is to be noted that the passage of the gas through a sulphuric acid solution in which there is present from 12 to 15 grams of the free acid does not by any means remove the hydrocyanic acid content of the gas.

HOUSE HEATING BUSINESS

(Continued from page 528)

Results Obtained With Installation

In this system there are about 2,100 sq. ft. of radiation and in one hour, with all burners on and burning at the rate of 780 cu. ft. of gas, the temperature of the water in the system was raised from 60 to 120 deg. F. When the house temperature is raised to 70 deg. F., the outside burners may be turned off and the center burners turned down to a minimum consumption of 210 cu. ft. per hour. In extreme weather the center burners may be operated full, which gives a consumption of 420 cu. ft. per hour.

Installation in Garage

The above installation was so satisfactory to the owner that he had us make a similar installation in his garage, which also contains the sleeping quarters of his chauffeur and other help. The building is 50 ft. by 50 ft., of frame construction, two stories high. The heating is carried out by means of a Crawford hot water boiler with a 23-inch fire pot and about 550 sq. ft. of radiators. In the center of the fire pot of this heater is placed a coil similar to that in a Stack heater, but larger and the flame from 13 three-inch burners plays on that coil. The flame from 19 additional three-inch burners also impinges upon the shell of the boiler at the base. This installation heats a ten-car garage with a large hall upstairs, a bath and two rooms. It requires about forty minutes to raise the temperature to 70 deg. F. with the burners on full, consuming 480 cu. ft. of gas per hour. When the building is up to temperature, the outside burners may be turned off and the inside turned down to a minimum consumption of 180 cu. ft. per hour or the inside burners may be operated at a full capacity of 360 cu. ft. per hour.

The above installations are only a few of those we have made and prove conclusively to our mind that if a company wants to go after this business an appreciable load may be obtained even with our present high rates. The customers for whom the above installations have been made are much pleased with their operation and are more than glad to pay the difference between gas and coal.

GAS BY THE BARREL

If manufactured gas were bought in barrels, there would be only about a pound in each barrel, according to Prof. Alfred H. White, of the University of Michigan.

The gas which cooks dinners and is distributed by gas companies throughout the country and the "gas" which is pumped into automobile tanks at the filling stations (so named primarily for purposes of brevity) bear but little resemblance to each other, he points out.

"The latter is, of course, gasoline, which is a liquid at ordinary temperatures, but becomes vaporized at the higher temperatures of the carburettor," he writes. "The city gas is a bulky commodity, and the only practical method of distribution is therefore through pipes laid in the ground and connected to each consumer's appliances.

Current Market Prices

COALS (By Courtesy of Coal Age)

A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.40 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.50
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	(*)
Kanawha mine run	Columbus	(*)
West Virginia lump	Cincinnati	2.00 to 2.50
W. Virginia gas mine run	Cincinnati	1.35 to 1.60
Midwest		
Indiana 4th vein lump	Chicago	2.75 to 3.00
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	2.70 to 2.95
Big Seam mine run	Birmingham	1.75 to 2.00
Southeast Kentucky lump	Louisville	2.00 to 2.35
Southeast Kentucky mine run	Louisville	1.25 to 1.75

B. Anthracite.

(Spot prices F. O. B. mines, gross tons),

	Market	Freight rates	Independent	Company
Egg	New York	$2.34	$9.00 to $9.25	$8.35 to $8.75
Egg	Philadelphia	2.39	8.35 to 9.50	8.70 to 8.75
Egg	Chicago (net tons)	5.06	7.68 to 7.77	7.73 to 7.81

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$3.25 to 3.40
Wise County, furnace	4.00 to 4.50
Alabama, furnace	5.00 to 5.50
Foundry, Newark, N. J., del.	10.41
Foundry, Chicago, ovens	12.50
Foundry, Boston, delivered	12.50
Foundry, St. Louis	12.50
Foundry, Granite City, Ill.	12.50
Foundry, Alabama	6.00

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	$1.95
Corning, Ohio	2.15
Lima	2.28
Pennsylvania	3.75 to 4.25
Wooster, Ohio	2.15
Indiana—Illinois.	
Illinois	2.07
Indiana	2.08
Oklahoma—Kansas.	
Healdton	.90
Mid-continent (low gravity)	1.00 to 1.25
Gulf Coast.	
Gulf Coast, Grade A	$2.00
Gulf Coast, Grade B	1.70

GAS OILS.

Gas Oil, Bayonne, bulk gal.	5½ to 6½c
Gas Oil (32-36) Illinois-Indiana,	5.05 to 5.30
Gas Oil (32-36) Oklahoma, gal.	2¾ to 3 c
Gas Oil (32-36) Gulf Coast, gal	5 to 5½c

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$64.20 to $65.20
Six-inch and over, Chicago	60.20 to 61.20
Four-inch, Birmingham	57.00 to 58.00
Six-inch and over, Birmingham	53.00 to 54.00
Four-inch, New York	70.60 to 71.60
Six-inch and over, New York	65.60 to 66.60
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; Reporter) 4-inch, plus $20; 3-inch, plus $20.

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb.	5 to 5¼c
Ammonia aqua, 20 deg. drums lb.	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb.	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb.	30 to 36 c
Ammonium sulphate, bulk F. O. B. Works, per 100 lbs.	$2.60 to $2.65
Potash prussiate, yellow casks, lb.	18½ to 19 c
Potash prussiate, red casks, lb.	35 to 37 c
Soda prussiate, yellow casks,	10½ to 11 c
Soda sulphocyanide, barrels, lb.	45 to 55 c

COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

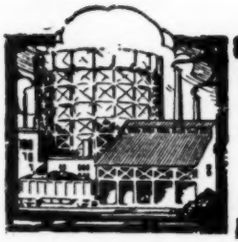
Benzol C. P. tanks, works, gal.	24 to 25c
Benzol, drums, gal.	30c
Benzol, 90% tanks, works, gal.	23c
Benzol, 90% drums, gal.	28c
Napthalene, flake, barrels, lb.	5 to 5½c
Napthalene, dyestuff bags, lb.	5 to 5½c
Solvent Naphtha, water white works, gal.	24 to 25c
Solvent Naphtha, drums, works, gal.	29 to 30c
Toluene, C. P. tanks, works, gal.	31c
Toluene C. P. drums, works, gal.	36c

* No quotation, due to strike.

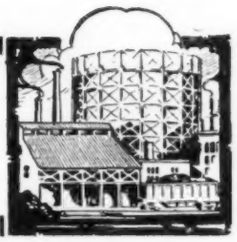
Output of bituminous coal during the week ended May 24, according to the Geological Survey, was 7,155,000 net tons, an increase of 124,000 tons over the week before, when 7,031,000 tons were produced. Production of anthracite fell off slightly, the output being 1,850,000 net tons, compared with 1,898,000 tons during the week ended May 17.

There has been no heavy drain on stocks thus far, even though some of the refiners have been drawing from storage stocks to take care of sudden spurts in buying. According to the Bureau of Mines, daily domestic production of crude oil during April averaged 1,973,153 barrels, while consumption of domestic oil amounted to only 1,863,133 barrels daily. Stocks of domestic crude on hand April 30 totaled 341,928,000 barrels, against 338,530,000 barrels March 31, and 268,925,000 barrels April 30, 1923.

Buyers were bearish on gas oil, and the price undertone continued easy. Sales were mostly confined to small quantities. The Bureau of Mines report on California production of gas and fuel oil during April shows a total output of 367,722,564 gallons, an increase of 6,837,468 gallons over March production. Stocks were increased by 57,323,634 gallons, making the total stocks on hand April 30, 766,688,556 gallons.



NEWS OF THE GAS INDUSTRY



Southern Gas Co. Boosting Sales

Augusta, Ga.—F. L. Marshall, general manager of the Gas Light Company of Augusta, is boosting the sale of gas and gas appliances in a big way. The company has just been granted authority by the Georgia Public Service Commission to put a three-part rate into effect on July 1 that will permit them to secure an appreciable industrial load, one customer having already been taken on who will use in the neighborhood of 500,000 cubic feet per month, while several other industrial customers, due to the new three-part rate, will increase their use of gas. The Gas Light Company of Augusta is the first company (gas) in the State of Georgia to adopt the three-part rate, applying it only to industrial users. The company has been very aggressively pushing the sale of domestic appliances in the past three months. During April a gas range sale was conducted, with the result that range sales in that month showed an increase of 194 per cent over the same month last year, while with a water heater sale in May the company increased water heater sales over last May 227 per cent.

The sales plans and advertising campaign of the Augusta company were worked out by William H. Matlack, merchandising counsel, who spent three months in Augusta.

Louis H. Buckley, President of Worcester Gas Co., Dies Suddenly

Worcester, Mass. — Louis H. Buckley, president of the Worcester Gas Light Company, Worcester, Mass., died suddenly, May 26, while driving his automobile.

Mr. Buckley, besides being president of the gas company, was vice-president of the U. S. Envelope Company, and was also active in civic affairs.

The news of Mr. Buckley's death was a tremendous shock to his legion of acquaintances, and especially to those who have been closely associated with him in the business and civic life of the city.

Few men were more widely known in Worcester and few, if any, enjoyed more popularity. Mr. Buckley gave of his time and his energy to every deserving cause and when there was need of accomplishment he was sought by his acquaintances to give counsel and advice. In business Mr. Buckley gloried in the consumption of a task and he had a way of inspiring those about him to their best efforts. In civic endeavor he was ever ready to lend his aid and his dynamic force and magnetic personality forced him to the front as a leader despite his efforts to remain in the background and modestly employ his services in whatever direction seemed most advantageous to the matter in hand.

The combination of force, personality, but more especially his capacity for work and sound judgment, was demonstrated in his rise from obscurity to a directing post of the big envelope concern, supervising more than a dozen large plants.

Again these qualities, coupled with his tenacity of purpose and ability to inspire, came to the fore in his assistance in the reconstruction and rehabilitation of the Worcester Gas Light Company.

Mr. Buckley's affiliation with the Worcester Gas Light Company began in 1918, when he was elected a director. In September of the following year, when Willard B. Osborne retired, he was elected president. He took up his duties in the midst of a strike, which had begun the previous month. Although faced with the most difficult position that had confronted any executive of the company in many years, he faced the task with courage and fortitude that begot confidence. When the strike was finally adjusted, in January, 1920, the affairs of the company were not in the most encouraging condition, and it was then that Mr. Buckley lent his executive ability to a task of reconstruction and rehabilitation that brought results.

During the days when the work was hardest he gave unlimited time and effort to the activities needing attention, but would accept no salary. One of his associates described his services at that time in the following language: "His thought was to give service at least cost to the people of the city with a reasonable return on the capital invested."

With Mr. Buckley's assistance and the co-operation of the directors, the company rapidly returned to a healthy condition, and by 1920 was again on a substantial foundation so far as service was concerned, and its financial condition was greatly improved. In 1921 the company resumed paying dividends on the common stock. The payments had been discontinued in 1919. The improvement has continued up to the present time and the company is now in a prosperous condition.

Louis H. Buckley was born in Worcester, October 12, 1865, the son of William T. and Emily I. Buckley. He was educated in the public schools of the city and was graduated from Classical High School in 1883. Then followed a course at Becker's Business College, where Mr. Buckley revealed the first signs of his capacity for business through his ready mastery of the details of the most intricate financial problems.

New Officials for People's Gas Light & Coke Co.

Chicago, Ill.—Following the resignation of Charles A. Monroe as vice-president and director of the People's Gas Light & Coke Company to become chairman of the board of the Laclede Gas & Electric Company of St. Louis, there has been an almost complete reorganization of the management of the People's Gas Company, only two officials retaining their original positions, these being the pres-

ident and assistant secretary. The changes were made last week, but no announcement was issued.

Whereas under the old form of management there was only one vice-president, the new organization has five, all of equal rank, who in the absence of the president will compose the management committee. There also has been established the position of assistant to the president. The complete list of officials follows:

Samuel Insull, president; George F. Mitchell, formerly treasurer, made assistant to the president and vice-president in charge of finance; John H. Eustace, vice-president in charge of operation; Bernard J. Mullaney, vice-president in charge of public and industrial relations; Theodore V. Purcell, formerly secretary, made vice-president in charge of sales; William A. Sauer, promoted from comptroller to vice-president in charge of accounts; Albert I. Tossell advanced from assistant treasurer to secretary and assistant treasurer; William R. Weldon, formerly assistant treasurer, made treasurer; William I. Coble, promoted from auditor to comptroller; William C. Langston, auditor.

Mr. Mitchell also will be chairman of the management committee and will serve in the same capacity at meetings of the budget and expense committee, which will be composed of the vice-presidents, the secretary, the treasurer, the comptroller, George C. Lowell, who is construction engineer, and George E. McKana, statistician. As vice-president in charge of finance, Mr. Mitchell will have supervision over the secretary and the treasurer and their departments and will himself exercise general direction over the purchasing, stores, claim and traffic departments and over the management of the People's Gas building.

Mr. Eustace will have supervision over all activities connected with the production and distribution of gas and the furnishing of transportation. Control of the company's relations with the public and employees will be in the hands of Mr. Mullaney, who will also exercise general direction over the general service, advertising, employment, medical, welfare, training and education departments, the safety bureau and restaurant. Mr. Purcell will be responsible for the sales activities and will exercise general direction over the new business, industrial and home service departments and over the People's Gas stores. Mr. Sauer will supervise all of the accounting, bookkeeping and accounting work.

Municipal Gas Co. Elects Directors and Widens Operations

Albany, N. Y.—Nine directors and three inspectors of election for the year 1924-1925 were elected at the annual meeting of the stockholders of the Municipal Gas Company. A resolution was adopted increasing the scope of business.

Directors elected were Robert C. Pruyn, Nicholas F. Brady, John A. Delehanty, Edward B. Cantine, Charles Gibson, James Cox Brady, E. Palmer Gavit, John S. McEwan and Neile F. Towner. James W. Cox, Thomas H. Powers and James McCredie were named inspectors of election.

The resolution provided that the certificate of incorporation be amended so operations might include the towns of Berne, Bethlehem, Coeymans, Colonie, Green Island, Guilderland, Knox, New Scotland, Rensselaerville and Westerlo; the villages of Altamont, Colonie, Green Island and Voorheesville and the cities of Albany, Cohoes, Watervliet, Troy and Rensselaer.

Americans Will Speak at London Convention

Discussion of public utility advertising will be one of the features of the International Convention of the Associated Advertising Clubs of the World in London in July. The program just made public by Frank L. Blanchard, director of public relations, Henry L. Doherty & Co., and chairman of the London program committee of the Public Utility Advertising Association, show four American speakers and four British speakers listed.

The American speakers and their subjects will be: "Municipal versus Private Ownership of Public Utilities," by B. J. Mullaney, the People's Gas Light & Coke Company, Chicago; "How to Win Good Will for the Company," by P. L. Thompson, Western Electric Company, New York; "Progress of Customer Ownership in the Sale of Shares," by Mr. Blanchard, and "Legal Aspects of Public Utility Advertising," by a speaker yet to be selected.

The subjects of the British papers will be: "Company Ownership and Operation Under Public Control," "Co-operative Advertising of a Public Utility," "The Personal Element in Advertising," and "Railway Advertising."

All the addresses will be made at a one-day session and luncheon by the association on July 16.

New Contracts Awarded

The Superior Water, Light & Power Co. of Superior, Wis., has placed a contract with the Stacey Bros. Gas Construction Co. of Cincinnati, Ohio, for a 750,000 cu. ft. holder. This company has also been awarded contracts for holders for the R. A. Blackwood Co. of Scranton, Pa.

German Gas Man Visits U. S.

Herr Franz Messinger, engineer in chief of the Greater Berlin Gas Works, is now in the United States by order of the directorate of the Berlin Gas Works, for the purpose of making a study in the public interest of American practice in the distribution of gas and its various uses. He expects to visit for this purpose New York, Philadelphia, Baltimore, Washington, Richmond, Cincinnati, St. Louis, Chicago, Detroit and Cleveland.

Herr Messinger, by reason of his numerous publications and technical articles, is widely known in technical circles. He is the director of the Department of Industrial Gas Development of the Greater Berlin Gas Works, which department he has managed with great success, having, among other things, induced the return of the use of gas by a great number of industrial furnaces which during the war were heated with oil. He is the first engineer in Germany who has been able to produce a faultless weld with an illuminating gas flame.

J. E. McDevitt Joins Ash Reclaiming Machinery Corp.

James E. McDevitt on June 1 joins Ash Reclaiming Machinery Corporation of 347 Madison avenue, New York, to devote his attention to the sale of the "Kolumbus" Coke Separator, a new machine recently developed in Europe for reclaiming the unburned fuel from coal and coke ashes of all kinds.

He was for many years a member of the Baumes-McDevitt Machinery Corporation of St. Louis. In 1917 he entered the service of the United States as engineer officer in the Flying Corps, and was ten months in France. After the war he became branch manager in Australasia for General Motors Export Corporation, and organized the foreign office in New Zealand. When the general contraction in export business decided him to return home, he entered the New York sales office of the Standard Heater Company, which connection he is now resigning.

Gas Man Honored

George W. Bixler, general advertising and publicity manager of the Public Service Co. of Colorado, has been chosen as representative of the Denver Advertising Club at the international convention of the Associated Advertising Clubs of the World, the convention to be held in London, England, July 13-19

Mr. Bixler, while of course representing the Doherty interetss, will drive another tack, making more secure the name of Denver to the rest of the world, but then he does that every day, because he has a way of boosting his home town while he boosts good old dependable gas.

Bon voyage, George, and may you have a nice time.

The Benefits of Gas

Charles Harrison, of the Public Service Co. of Colorado, lectured before the East High School in Denver, his subject "Gas." Mr. Harrison carried his audience from the time the coal is mined until it is baked, how the gas is accumulated, transported, used, its value to humanity. In addition to the clear-cut way in which every wrinkle was explained, Mr. Harrison used stereopticon slides, driving every point home.

As Usual, Right on Time

The hot weather will soon be with us. Anticipating that and wishing to help humanity, as also its sales, the Public Service Co. of Colorado is offering gas ranges at $1 down and small monthly payments. Such low rates will reap many sales. The tempting offer is another demonstration of sales getting, timely advertising, and these two things working together spell—Success.

Boston City Council Votes for 10-Year Lighting Contract

Boston, Mass.—A City Council majority abruptly ended all academic discussion as to the wisest course for Boston to pursue with relation to any new street lighting agreement by voting into effect the ten-year agreement offered jointly by the Boston Consolidated Gas Company and the Welsbach Street Lighting Company of America, the only bidders.

The Finance Commission had expressed the opinion that it would be better to undertake an arrangement with the Edison Company with a view to supplanting gas with electricity as illuminant, and the Chamber of Commerce also opposed any such contract as that adopted.

The contract voted into effect, which calls for payments of $300,000 a year for this service, or $3,000,000 in all, an advance of $50,000 per year over the old rate, or $500,000 in all, will undoubtedly be approved by Mayor Curley.

This contract also lacks that clause of the old contract which provided for terminating the ten-year agreement at the end of five years, if such a course seemed preferable to the city government. When the Mayor signs the contract the city will be bound to abide by it for ten years.

Gas Rates Increased

Canandaigua, N. Y. — Public Service Commission has granted the increase in gas rates sought here by the Rochester Gas & Electric Corporation, and has also established a 537 B.t.u. standard, as sought by the corporation.

New rates, effective May 20, for gas supplied to Canandaigua residents, are as follows: First 100 cubic feet, 60 cents; next 4,900 cubic feet, $1.60 per thousand; next 5,000 cubic feet, $1.40; over 10,000 cubic feet, $1.30; minimum monthly charge, 60 cents.

City Attorney Fred D. Cribb indicated no further effort would be made to fight the increase. Two hearings were conducted here by Commissioner Charles VanVoorhis, at which it was shown that in 1923 the corporation received from its gas sales in this city $56,195, while its operating expenses were $63,718, or a deficit of $7,522. According to the ruling of the commission, the 6 per cent return asked is lower than that usually allowed by commissions and courts.

Contracts Awarded

The Salem Gas Light Company, Salem, Mass., has awarded contract to the Gas Machinery Company, Cleveland, Ohio, for a 24-inch concentrator for the recovery of free and fixed ammonia.

The concentrator will be equipped with carbonic acid expeller for elimination of the excess of carbonic acid, thereby providing against the formation of injurious salts in concentrated liquor.

The new ammonia equipment will be installed in the building now occupied by present intermittent still.

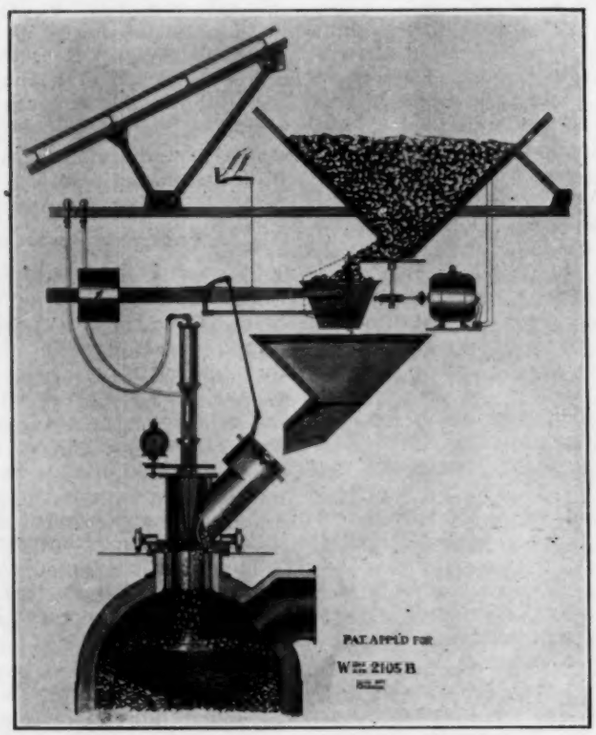
The North Shore Gas Company of Waukegan, Ill., is installing a new nine-foot water gas set at its gas plant. Contract for furnishing this set has been awarded the Western Gas Construction Company of Fort Wayne, Ind.

The Miami Gas Company, Miami, Florida, has awarded a contract to the Western Gas Construction Company of Fort Wayne, Indiana, for the furnishing of two new purifiers for their gas plant in that city.

With The Equipment & Appliance Manufacturers

Howard Automatic Chargers

The Western Gas Construction Co., Fort Wayne, Ind., recently issued Bulletin No. W. 36, devoted to the Howard Automatic Chargers for water gas sets. The illustration shows a sectional view of the apparatus. In the Bulletin they state that "the Howard Automatic Charger is of cylindrical design and fits over the charging door frame on the top of the generator. In the center of this cylinder is a shaft which has a vertical motion actuated from a hydraulic cylinder placed on top of the charger. A cast iron spreader is attached to the bottom of this shaft and goes down into the dome of the generator when the shaft is in its lowest position. When the shaft with spreader attached reaches the lower position it engages with a friction clutch operated by means of a motor placed on the side of the charger. This gives the shaft and spreader a whirling or rotating motion so that when the fuel drops on to this spreader, both the fine and the coarse pieces are thrown against the side walls of the generator.



The generator fuel is introduced into the charger by means of a chute in the top of which is a valve operated by means of a hydraulic cylinder with rack and pinion. The spreader acts as a valve while the fuel is entering the charger and the top valve is open. At the bottom of the chute there is a set of retaining prongs for holding the fuel until the proper time comes for it to go into the generator. These prongs are actuated by means of a lever motion from the shaft carrying the spreader and release the fuel after the spreader is in its lowest position.

The automatic charger is mounted on wheels similar to the standard charging door and runs on the same track so that it can be removed to one side and replaced by the ordinary charging door without interruption to the operation of the water gas machine.

Variation in speed of the charging bell permits of various degrees for concave coning the fire. Alternating non-whirling charges with high and low speed whirling charges may be combined to keep practically a level fire.

Honeco Thermometers and Temperature Controllers Become Part of the American Schaeffer & Budenberg Line

The American Schaeffer & Budenberg Corporation announce that they have acquired the important assets, including patents, trademarks, trade names and good will, of the firm of Hohmann-Nelson Company, Eau Claire, Wis.

The personnal of the Honeco organization, including A. J. Nelson and department heads, will be retained and will be greatly strengthened by the complete facilities, both engineering and manufacturing, of the American Schaeffer & Budenberg organization at their Brooklyn, N. Y., plant, and Honeco users are thus assured of much better service than they have received in the past.